

COLORADO DEPARTMENT OF TRANSPORTATION STAFF BRIDGE BRIDGE DETAIL MANUAL	Chapter: 9 Effective: July 13, 2017 Supersedes: September 25, 1981
CONSTRUCTION LAYOUT	

9.1 PURPOSE

This drawing is to show a plan of the superstructure showing pertinent information necessary for construction of the structure.

9.2 RESPONSIBILITY

This drawing shall be prepared and checked in the design unit. The graphic presentation of information on this drawing shall be the responsibility of the individual preparing the drawing.

9.3 SCALES

Standard Architectural and Civil scales should be used that are suitable to fit the details to a standard sheet.

9.4 COMBINING DETAILS

The "Construction Layout" and the "Footing and Piling Layout" may be placed on the same sheet if practical. Other details may be placed on this sheet; i.e., drain details, etc.

If the "Construction Layout" is combined with other details, it should occupy the top half of the sheet. Other configurations may be used depending on the type of structure or structures. (Left half, upper left corner, etc.)

9.5 HORIZONTAL CONTROL LINE

The horizontal control line shall be shown and labeled consistently with the plans. For twin structures the horizontal control line shall be shown and labeled for each structure such as: "Proj. Line - Str. No. G-18-L".

9.6 LAYOUT LINE

For structures on tangent, the layout line and the horizontal control line will coincide, and shall be labeled such as "Survey Line", "Proj. Line", etc.

For structures located on a curve, the layout line may be:

- A) Ahead Tangent: The tangent ahead of the point of intersection (PI) of the curve.
- B) Back Tangent: The tangent back of the PI of the curve.
- C) A chord between two specified points.
- D) A tangent to the horizontal control line at some given point (POC) on the horizontal control line.

The layout line shall be shown and labeled such as "Tangent from TS Sta. 31+48.08", "Chord from POC Sta. 38+41.00 to PT Sta. 39+78.00", "Tangent from POC Sta. 382+10.00", etc.

Bearings shall be given for all layout lines, to the nearest second.

9.7 STATIONING

Stationing shall be shown on the horizontal control line where it intersects with the centerline of bearing at abutments and centerline of piers. Stationing shall be given to two decimal places.

9.8 CENTERLINES

The following centerlines shall be shown and labeled:

- A) Centerlines of bearings at abutments and piers.
- B) Centerlines of piers.
- C) Centerlines of all girders.
- D) Centerline of roadway, median, etc., where required.
- E) Centerlines of diaphragms if not shown elsewhere on the plans.

9.9 DIMENSIONS

All dimensions shall be given in feet and inches (to the nearest 1/8 inch) except as noted.

- A) The following dimensions shall be shown for all structures:
 - 1) End of wingwall to end of wingwall along outside of deck.
 - 2) End of wingwall to Centerline Abutment Bearings, Centerline Abutment Bearings to Centerline Piers, Centerline Piers to Centerline Piers, etc. along outside edge of deck.
 - 3) Back Face Abutments to Centerline Bearings. (Use design dimension - normal to Centerline Bearing or parallel to girder.)
 - 4) Centerline Pier Bearings to Centerline Piers (Use design dimension - normal to Centerline Pier or parallel to girders.)
 - 5) Normal (radial) from Horizontal Control Line to Centerline Girders. (Except straight girders on curved structures - see below.)
 - 6) Normal (radial) from Horizontal Control Line to inside of curbs, inside of curbs to outside of deck, etc.
 - 7) Normal (radial) outside of deck to outside of deck.
 - 8) Normal (radial) Horizontal Control Line to Profile Grade Line.
 - 9) Location of Centerline Diaphragms (if shown).

Dimensions along edge of deck, 1) and 2) above, need not be repeated if they are the same on both sides of the structure.

- B) For structures on a curve with curved girders, the following dimensions shall be added to the above:
 - 1) Along layout line from point of tangent to centerline of abutments and piers. (Nearest hundredth of a foot) (A note similar to "538.12 ft. back on tangent from ST Sta. 1281+48.00" shall be used if the point of tangent cannot be shown on the drawing.)
 - 2) From layout line to Horizontal Control Line along centerline of abutment bearings and piers (nearest hundredth of a foot).
 - 3) From layout line to outside of deck along centerline of abutments and piers.

- C) For structures on a curve with straight girders the following dimensions shall be added to (A) and (B) above:
- 1) Length of chords. (if used)
 - 2) Location of chords if not located on Horizontal Control Line. (Nearest hundredth of a foot)
 - 3) Girder offsets from chords.
 - 4) For flared girders, dimension from horizontal control line along centerline of bearings. (Nearest hundredth of a foot)
 - 5) Length of girders. (CL to CL Bearings)
 - 6) Offsets from centerline of outside girders to outside of deck at 10th points (100 ft. spans or less) or 20th points (spans of more than 100 ft.) along girders. Offsets may be tabulated.

9.10 ANGLES

Angles shall be shown to the nearest second:

- A) Angles between Layout Line and centerlines of abutments and piers.
- B) Angles between straight girders and centerline of bearings, if girders are not parallel to the Layout Line.

9.11 BENCH MARK

Most new bridges do not have a bench mark. Older bridges may have benchmarks. If required, contact Project Manager to coordinate with Survey group.

9.12 ELECTRICAL CONDUIT & JUNCTION BOXES

Electrical conduit shall be shown on this drawing if required.

Use a minimum of 1-1/2" electrical conduit for longitudinal runs and 3/4" electrical conduit for transverse runs.

Location of junction boxes shall be shown on this drawing as required.

See CDOT Bridge Design Manual Section 2.8 for maximum length between junction boxes.

9.13 DRAINS

Drains shall be shown and located on this drawing as required. A detail may be required for clarity.

9.14 CHECK ITEMS

The following is a summary of information to be shown on the drawing, as required. Additional information may be shown according to the individual structure.

- A) Standard North Arrow
- B) Label horizontal control line and give bearing, if structure is on tangent.
- C) For structures on a curve, label and give the bearing of the layout line and point of tangency, or the end points for a chord.
- D) Stationing
- E) All centerlines

- F) All necessary dimensions
- G) Curb offsets
- H) All required angles
- I) Electrical conduits & junction boxes
- J) Drains
- K) Title the plan "CONSTRUCTION LAYOUT". For plans with more than one structure, add the structure number to the title.
- L) Label back face of abutments, centerline of bearings and centerline of piers.
- M) Dimension widths of curbs and sidewalks
- N) Project number in proper locations.
- O) Typical notes
- P) Complete title block
- Q) Spacing and location of type 10 rail posts
- R) Spacing and location of fencing

9.15 TITLE BLOCK

This drawing is titled "CONSTRUCTION LAYOUT" and shall be so indicated in the title block.

If other details are combined on this drawing, they should be so indicated in the title. Examples: If the "Piling Layout" is placed on a drawing with the "Construction Layout", the title of the sheet would be:

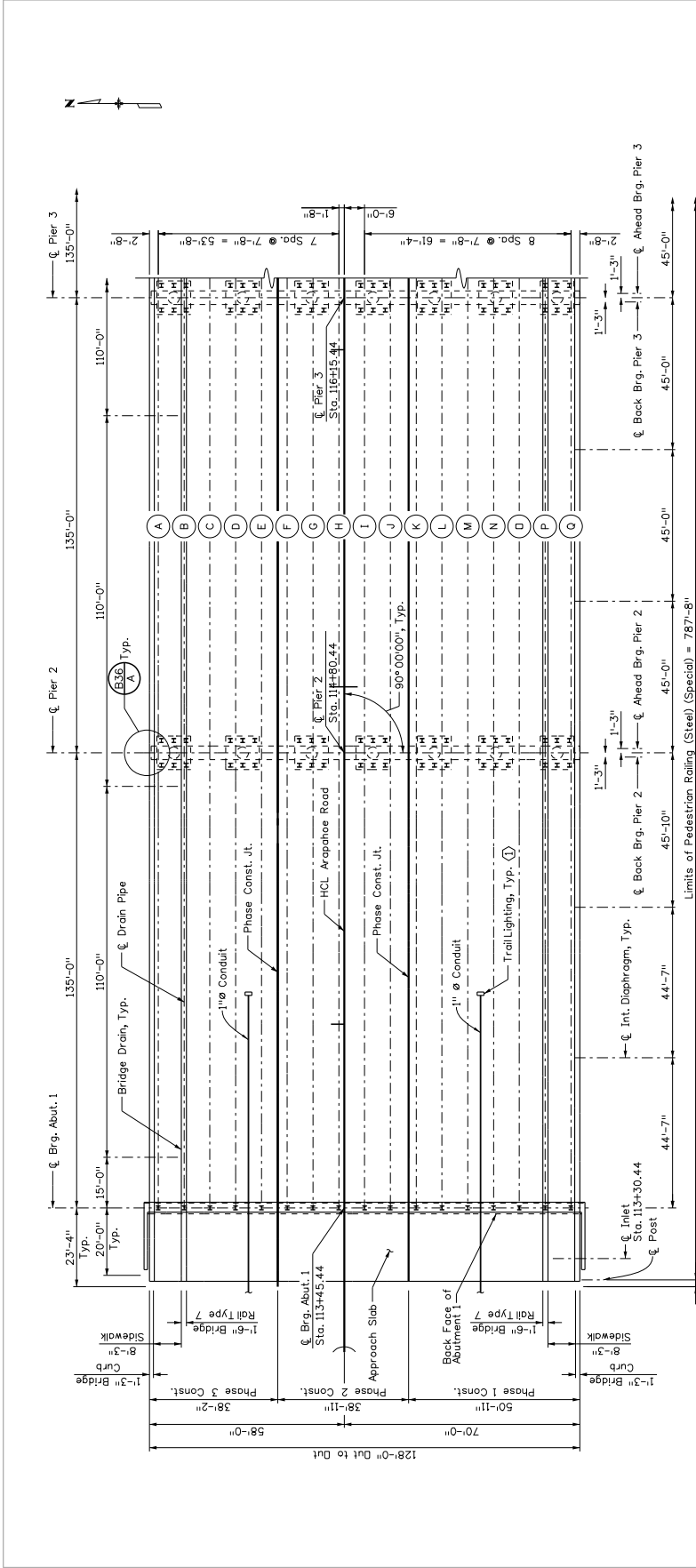
CONSTRUCTION LAYOUT

PILING LAYOUT

9.16 TYPICAL NOTES

The following notes shall appear on the drawings, as applicable:

- A) Edge Offsets Note: All edge offsets are placed at 10th points (or 20th points) normal to the girder.



SPAN 1 **SPAN 2**

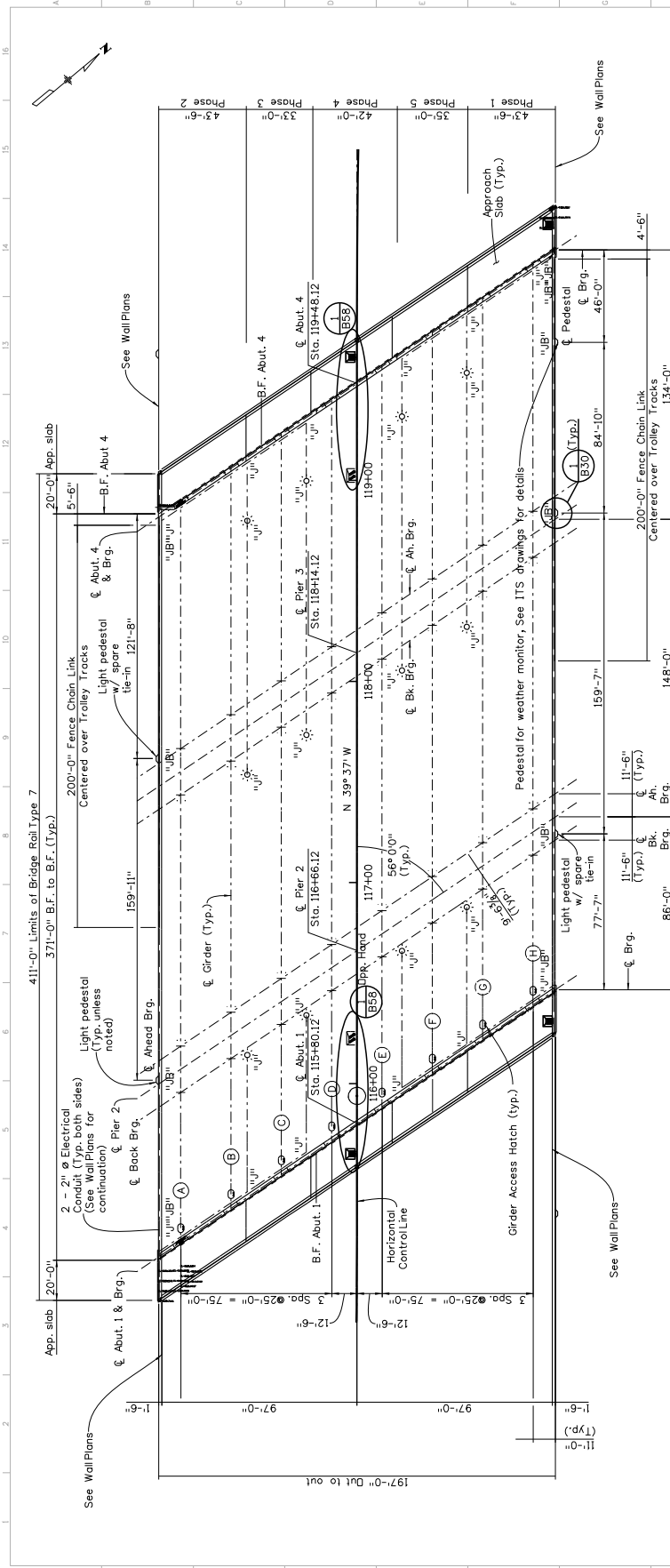
Notes:
 1. For Intermediate Diaphragm Details, see Dwg. No. B42.
 2. For Girder Details, see Dwg. No. B41.
 3. For Wingwall Layout and Details, see Dwg. No. B22
 4. For Approach Slab Details, see Dwg. No. B50.
 5. Electrical Conduit in Barriers and Deck:
 2 - 2" Conduit in the interior barriers.
 1 - 3" Conduit in the exterior curbs.
 1/2" Conduit for street lights & trailights
 3/4" Conduit for step lights
 6. For other size conduit used see quantity & payment on lighting plans.

CONSTRUCTION LAYOUT

KEY NOTES:
 ① For Path lighting under bridge deck, Contractor coordinate with lighting designer. For conduit sizes and length, see lighting plans.

Print Date:	File Name:	Horiz. Scale:	Vert. Scale:	Unit Leader:	Initials:	Sheet Revisions:	Date:	Comments:	As Constructed:	ARAPAHOE OVER CHERRY CREEK CONSTRUCTION LAYOUT (1 OF 3)	Project No./Code:	FBR 088A-031	
Staff Bridge Branch - Unit 022X	Unit Leader:	Initials:	Initials:	Initials:	Initials:	No Revisions:	Revised:	Void:	Designer:	M. Mohseni	Structure Number:	F-17-1B	
1600 Broadway, Suite 1300	Denver, Colorado 80202	Phone: 303-539-3300	Fax: 303-539-9600	Region 6	JH	Colorado Department of Transportation	3520 South Parker Road	Phone: 303-337-9519	FAX: 303-750-7452	Detailer:	A. Price	Sheet Number:	18147
<p>HNTB</p>													

Design	Checked By:	INITIAL	DATE	Quantity	INITIAL	DATE
Detail	Checked By:	INITIAL	DATE	Quantity	INITIAL	DATE
Quantity	Checked By:	INITIAL	DATE	Quantity	INITIAL	DATE



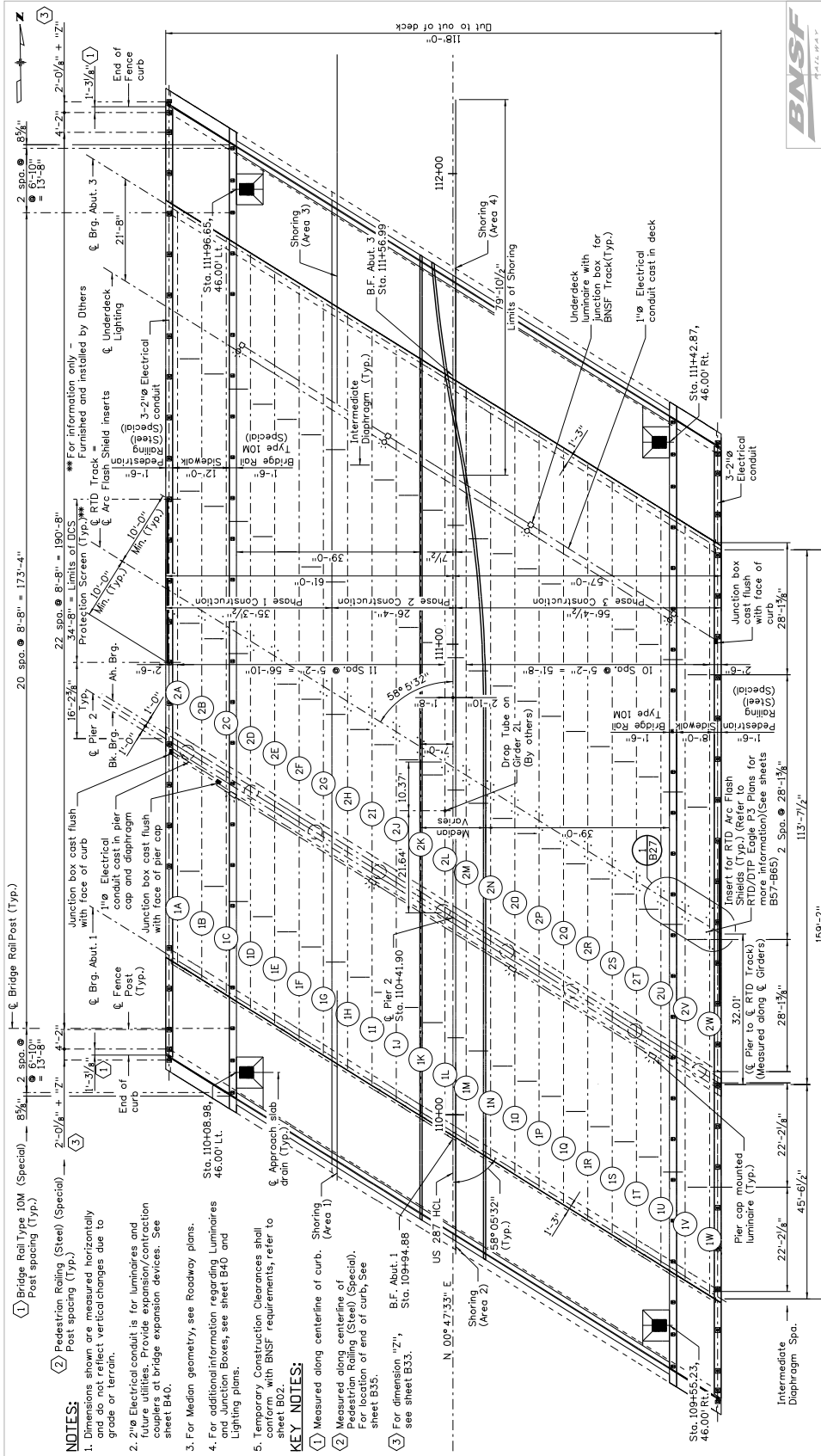
- Notes:**
- All exposed Electric Conduit shall be Galvanized rigid metal.
 - Junction box shall be flush to front face of Bridge Rail and provided with cover. Drain for interior condensation.
 - For pull box information, see light pedestal drawings No B30 & B31.

CONSTRUCTION LAYOUT

- Hidden Luminaire Location. See Lighting Plans for Details.
- 6"x6"x4" Junction Box flush with bottom of slab. Drain for interior condensation.
- "JB" = 8"x18"x8/2" Barrier Junction Box

Print Date:		Project No./Code	
File Name:	Date:	BR 9600-297	
Horiz. Scale: 1" = 50'	Verif. Scale: As Noted	CONSTRUCTION LAYOUT	
K Starff Bridge Branch - Unit 0224	Unit Leader: MH	As Constructed	
Region 6		No Revisions:	Designer: A. Pott
		Revised:	Structure F-16-XB
		Void:	J. Viridi Numbers 16212
		Sheet Subst: BRIDGE Subst Sheets: B15 of 79	
		Sheet Number 15	

Design	INITIAL	DATE	Checked By	DATE
AP	AP	12/10	AP	12/10
MS	MS	12/10	MS	12/10
AP	AP	12/10	AP	12/10
AP	AP	12/10	AP	12/10



BNSF
5.46 RAMP
FRONT RANGE SUB
2447701

Project No./Code
FBR R600-417
18908
Sheet Number

FEDERAL BLVD., (U.S. 287)
CONSTRUCTION LAYOUT

As Constructed
No Revisions:
Revised:
Void:

Designer: P. Fernandez
Structures
Detailer: E. Schwab
Numbers
Sheet Submitt: Bridge
Sheet: B11 of 65

Colorado Department of Transportation

4670 Holly Street
Denver, CO 80216-6408
Phone: 303-398-6781
FAX: 303-398-6781

Region 1

JD

CONSTRUCTION LAYOUT

Print Date:
File Name:
Horiz. Scale: 1:20
Staff: Bridge Branch - AJP
4601 DIC Boulevard, Suite 700
Denver, CO 80221-7215 Fax: (303) 221-7216

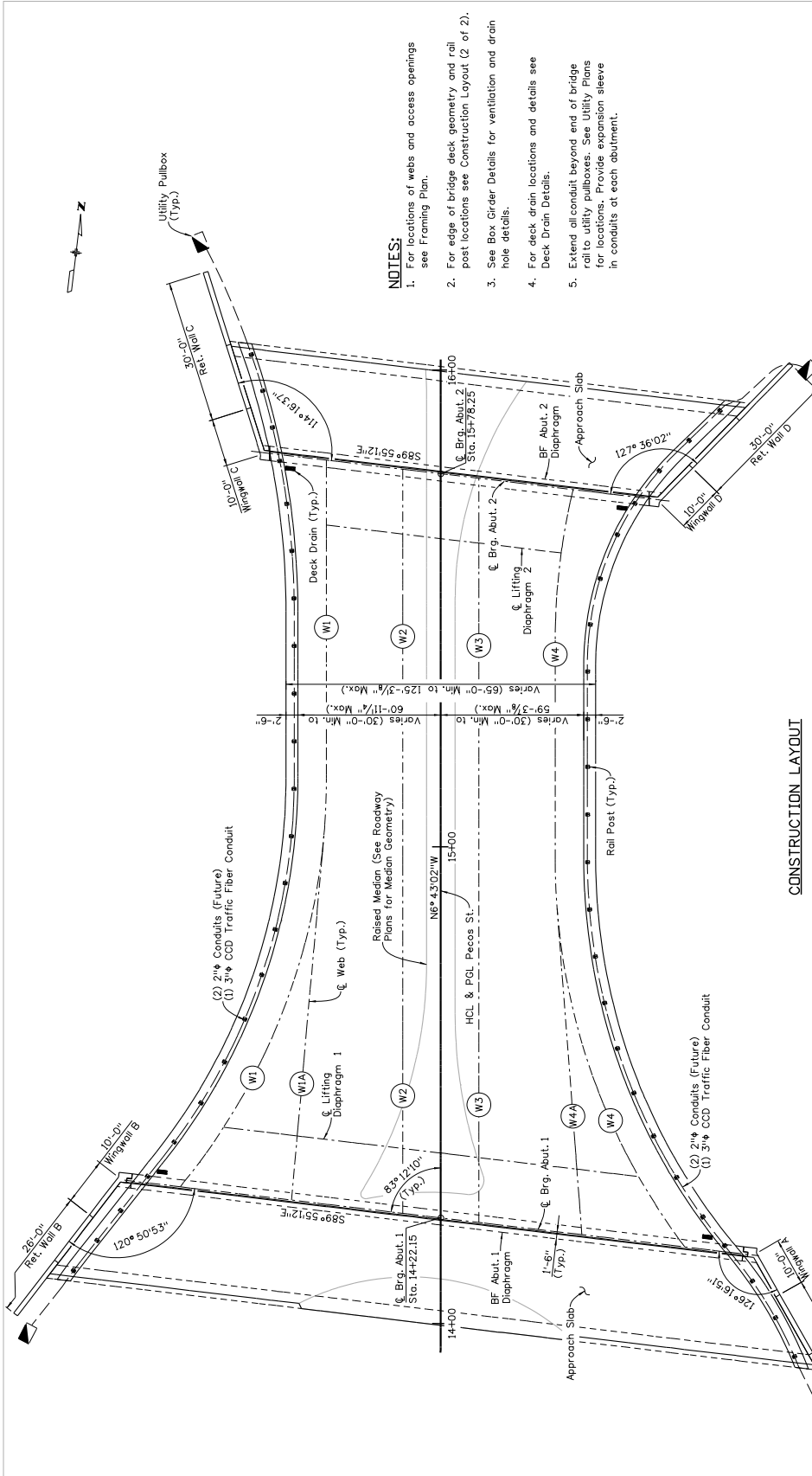
Vertical Scale: As Noted
Unit: 0.224
AJP

Sheet Revisions

Date:	Init.	Comments

- NOTES:**
- Dimensions shown are measured horizontally unless noted otherwise. Vertical dimensions are measured from the finished ground or terrain.
 - 2" x 2" Electrical conduit is for luminaires and future utilities. Provide expansion/contraction couplers at bridge expansion devices. See sheet B46.
 - For Median geometry, see Roadway plans.
 - For additional information regarding Luminaires and Junction Boxes, see sheet B40 and Lighting plans.
 - Temporary Construction Clearances shall conform with BNSF requirements, refer to sheet B02.
- KEY NOTES:**
- Measured along centerline of curb. Shoring (Area 1) Measured along centerline of Pedestrian Railing (Steel) (Special). For location of end of curb, see sheet B35.
 - For dimension "Z", B.F. Abut. 1 Sta. 109+94.89 see sheet B33.

Design	DATE	INITIAL	DATE	Checked By	DATE



Print Date:	10-12-12	Sheet Revisions	Colorado Department of Transportation	As Constructed	Project No./Code
File Name:	10-12-12	Comments	2000 South Holly Street Phone: 303-512-4105 FAX: 303-757-9963	No Revisions:	PECOS STREET OVER I-70 CONSTRUCTION LAYOUT (1 OF 2)
Unit: 0224	Unit Leader: AJP	Initials	Region 6	Revised:	Designer: T. Johnson Structure Detailer: K. Kolbrinberg Numbers
Checked By: MTP	Checked By: BEB	Checked By: MTP	REG	Void:	Sheet Number
Checked By: TRJ	Checked By: MRP	Checked By: TWM			FBR 0704-224
Checked By: TWM	Checked By: TWM	Checked By: TWM			E-16-Y0
Checked By: TWM	Checked By: TWM	Checked By: TWM			18149
Checked By: TWM	Checked By: TWM	Checked By: TWM			Sheet Number

Design	Check	Date	Quantity	Initial	Date
Design	Checked By	10/12	1	TWM	10/12
Check	Checked By	10/12	1	TWM	10/12
Quantity	Checked By	10/12	1	TWM	10/12
Initial	Checked By	10/12	1	TWM	10/12
Date	Checked By	10/12	1	TWM	10/12

